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INNER
BOX IS
PRE-CHILLED.

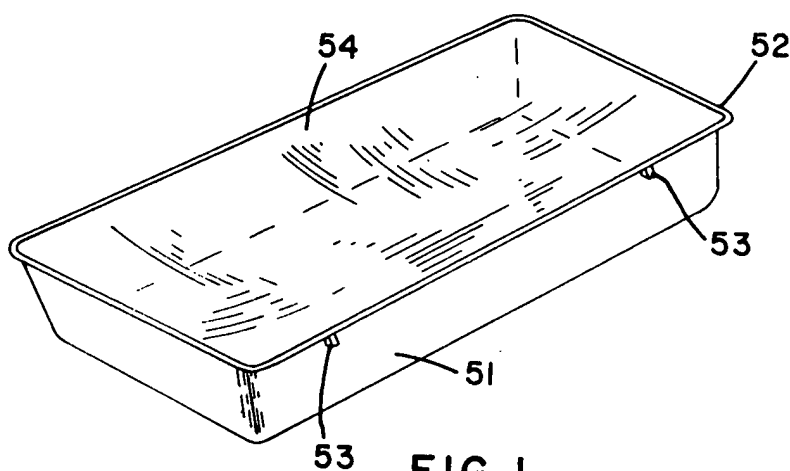


FIG. 1

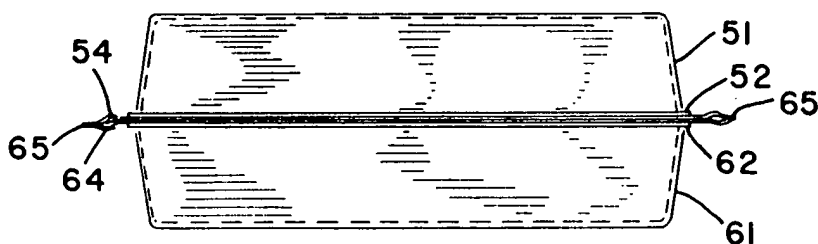


FIG. 2

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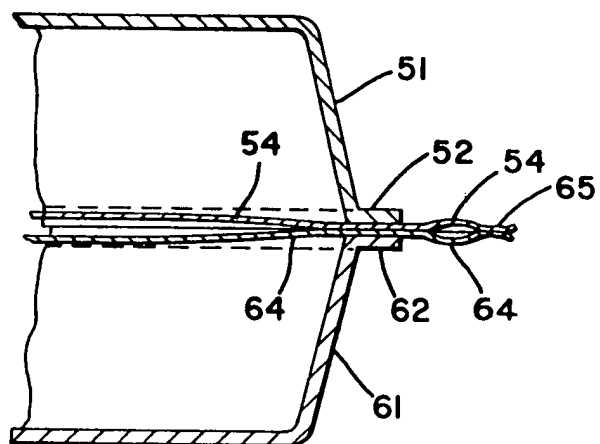


FIG. 3

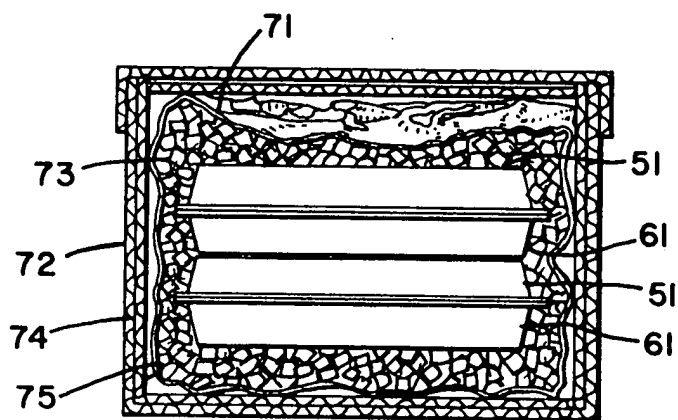
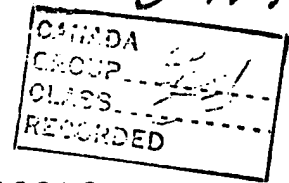


FIG. 4

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⑪ ① ② ③ No. 942263

④⑤ ISSUED Feb. 19, 1974

⑥⑦ CLASS 226-23
C.R. CL.

⑩ **CANADIAN PATENT**

⑪⑫ **METHOD FOR PACKAGING OF FRESH FOOD PRODUCTS**

Calder, Robert L., Cookshire, Quebec, Canada

Granted to General Plastics Company Limited, Cookshire,
Quebec, Canada

⑬⑭ APPLICATION No. 173,351
⑮⑯ FILED June 6, 1973 Div'n of Appl'n No. 017,769 filed Apr. 18, 1968

⑰⑱ PRIORITY DATE

No. OF CLAIMS 3

This publication is a photographic reproduction of the specification filed by the applicant for patent of invention. Any spelling or grammatical errors in the specification are the responsibility of the patentee.

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This invention relates to the packaging of perishable products, such as fresh food products and particularly fish products such as fresh fish fillets.

This application is a divisional of Canadian Application No. 017,769, filed April 18, 1968.

Fresh fish fillets have conventionally been shipped from the fishing area to the markets in wooden boxes which have been filled with fish and nailed shut by hand. This method of packing was originally conceived some half a century ago. The fish are normally packed in 10 lb. and 20 lb. boxes, and these boxes are constructed from pine wood and are fitted with a wooden cover. About 22 lbs. of fish are loaded into a 20 lb. box and the cover is then nailed in place. As the fish is compressed by the closing operation and as the box is not water proof, there is normally a drip loss of approximately two lbs. in transit. The fish fillets are placed in the old boxes under considerable pressure so as to prevent them from tangling or otherwise rolling over in the box. Such rolling results in damage to the fish fillets with considerable loss in salability.

The additional loading of about 2 lbs. of fish per box is necessary so that there will be approximately 19-1/2 to 20 lbs of fish in the box when it reaches the retailer. This loss of fishjuices is obviously undesirable. For example, it results in a loss in flavour of the fish, and the run-off, which of course is strongly flavoured by the smell of fish, results in much higher cost for shippers since special box cars and trucks must be employed only for fish.

The usual practice today consists of placing eight 20 lb. boxes or approximately 160 lbs. of fish in a large wooden crate. The crate itself weighs fifteen to twenty pounds, and the wooden boxes of fish are placed in this crate along with 240 lbs. of ice. The wood of the containers is not a particularly good insulator and large amounts of ice are necessary. This seriously reduces the available payload in shipment of fish and represents an additional factor tending to increase the cost of shipping fresh fish.

In my copending application No. 017,769, there is described a

package for fresh food products comprising a plurality of inner boxes containing the products, each inner box being made of thermoplastic material and comprising a tray portion having a bottom, side walls and end walls, and a membrane top peripherally heat sealed to an integral outwardly extending flange on the said side and end walls, the package further comprising a substantially waterproof container accommodating the inner box or boxes together with ice.

10 In the preferred arrangement, the waterproof container comprises a thermoplastic closable overwrap bag which contains the inner box or boxes and the ice refrigerant, and said waterproof container further comprises an outer box containing the overwrap bag, the outer box being preferably made of corrugated cardboard provided with a waterproof coating such as polyethylene on one or more surfaces thereof.

20 In accordance with the present invention, a process for packaging fresh food products comprises the steps of inserting said products into a tray portion of an inner box, said tray portion being of thermoplastic material and having a bottom, side walls, and end walls, and having an integral outwardly extending flange surrounding the tops of the side walls and end walls, applying a thermoplastic membrane over the said tray portion and heat sealing said membrane to said flange thus producing a sealed inner box, pre-chilling said inner box and its contents by immersion in a brine solution, and then inserting one or more of said inner boxes into a substantially waterproof container together with ice.

When the package is to be used for fish products, four of the inner boxes may be placed inside this outer container along with approximately fifty pounds of ice. The thermoplastic inner box keeps the fish out of contact of the fresh water produced by the melting of the ice and gives the retail fish dealer a very pleasant container well adapted to displaying the fish for sale.

30 The process of this invention allows fish packers to prechill their fish shipments without incurring undue capital expenditure. Fish is currently packed at an average temperature of 55° Fahrenheit and prechilling to 32°

has been under consideration for many years. The very high cost of chilling equipment has prevented widespread use of this practice. However, with this invention the containers are immersed in brine tanks maintained at 28° to 32° Fahrenheit and it appears that no more than two hours is required to drop the temperature to 32° Fahrenheit. A brine tank is a very inexpensive item to build and brine solutions are abundant in all fish packing operations. By prechilling the fish to 32° Fahrenheit, the fish packer may make more advantageous use of air shipments, using a small amount of ice. In this manner he will be able to reach customers further afield than he is now doing. Moreover, with the fish prechilled at 32° Fahrenheit there is a saving of approximately 15% in the amount of ice used for current shipments using rail and truck.

Such prechilled fish may be maintained for up to a week in inventory before it becomes imperative to ship the fish or freeze it if no immediate markets for fresh fish are available.

In the drawings that accompany this specification:

Fig. 1 is a perspective view of an inner box used in the process of this invention, and having a membrane heat sealed to the side and top walls.

Fig. 2 shows a variation on the embodiment shown in Fig. 7 wherein two separate boxes are affixed together in face to face contact.

Fig. 3 is a section showing a detail of the edge of the pair of boxes shown in Fig. 2.

Fig. 4 shows semi-schematically in cross-section a box containing four inner packs of fish together with ice in an over-wrap bag.

Fig. 1 shows an inner box used in this invention including a tray portion 51 adapted to contain 20 lbs of fish provided with an outwardly extending flange 52 around the sides and ends thereof. In the embodiment shown the flange 52 is reinforced at eight points around the periphery of the tray portion by reinforcing fillets 53, which also provide a stop member which prevents the tray portions 51 from nesting too tightly during storage while empty. The tray portion is sealed after filling with fish by the application of a thin flexible membrane top 54. Membrane 54 is sealed to

the tray portion all around its periphery by conventional heat sealing techniques. Polyethylene sheet of eight mils thickness has been found to be satisfactory for the membrane 54. In certain applications it may be desirable to use thicker sheet for this membrane in order to provide greater strength and to ensure adequate thickness of plastic around the heat sealing area. The use of a membrane of polyethylene sheet heat sealed to the fish box results in a completely water-proof container suitable for immersion in a brine solution for pre-chilling the fish. The sealed inner box of fish as shown in Fig. 1 may be sold in a suitable container along with ice. Two of these boxes can conveniently be affixed together in face to face contact so that the membrane tops are adequately protected against injury or perforation thereof. The two boxes can be held together in face to face relationship by the use of any suitable means for example the use of webless tape. The box and flanges may be provided with locating lugs in order to facilitate the location of one box upon another.

Care must be taken to ensure that the flanges do not become unduly distorted by the use of tape encircling two boxes in such face to face contact.

Fig. 2 shows another form of the present invention in which each box is sealed by means of a membrane as outlined above. However, in this embodiment the membrane extends outwardly beyond the flange and when two such sealed boxes are placed in face to face contact a second peripheral heat seal is applied at or beyond the flanges so as to hold these two boxes together. In Fig. 2 each of the fish containing boxes 51, 61 is provided with flange 52, 62 and each is peripherally heat sealed to a membrane 54, 64. The membranes 54 and 64 are then heat sealed to each other at heat seal 65 which extends peripherally all around the pair of boxes outside of flanges 52 and 62.

Fig. 3 shows in cross section a detail of the flange area of Fig. 2. Fig. 3 is not to scale and the space between membranes 54 and 64 is exaggerated for purposes of clarity.

Fig. 4 shows a preferred embodiment of the fish-packing system. In Fig. 4 each of the four boxes 61 is heat sealed with a membrane as shown

in Fig. 1 and is affixed in face to face contact with a second box 61, preferably in the manner shown in Figs. 2 and 3. The four 20 lb. containers are placed in a plastics bag 71 in a protective container 72 formed of corrugated cardboard. Ice 73 is also provided in the plastics bag 71 in sufficient quantities to provide the necessary cooling effect to keep the fish at a low temperature during storage and transportation to the retail outlet. In the embodiments shown in Fig. 4 the outer box is made from "B" flute Kraft cardboard composing the outside layer 74 and an "A" flute Kraft liner 75. The Kraft cardboard is preferably coated on one or more of its surfaces with a two to
10 three mil polyethylene vapor barrier or a hot melt paraffin coating. Plastic overwrap bag 71 is preferably a 6-8 mil double sealed polyethylene bag. The complete fish-packing system shown in Fig. 4 represents a system which has met widespread commercial acceptance.

Suitable material for the tray portion of the box are polyolefins and particularly polyethelene. The tray portion may be formed of high density polyethylene of 60-70 mil thickness and the top may be made of relatively softer low density polyethylene.

As an alternative to the overwrap bag and outer cardboard box, the waterproof container may be of foamed thermoplastics insulating material
20 such as expanded polystyrene. A foamed plastic container of this kind is preferably contained within an external cardboard shell.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A process for packaging fresh food products, comprising inserting said products into a tray portion of an inner box, said tray portion being of thermoplastic material and having a bottom, side walls and end walls, and having an integral outwardly extending flange surrounding the tops of the side walls and end walls; applying a thermoplastic membrane over said tray portion and heat sealing said membrane to said flange thus producing a sealed inner box, pre-chilling said inner box and its contents by immersion in a brine solution, and then inserting one or more of said inner boxes into a substantially water-proof container with ice.

2. A process according to Claim 1, wherein the fresh food product is fish fillets.

3. A process according to Claim 1 or 2, wherein a plurality of said inner boxes are inserted into a thermoplastic overwrap bag together with ice, and wherein the bag is then inserted into an outer box, the combination of the bag and outer box providing said water-proof container.